MARINE RELATED ACTIVITIES: AN ASSESSMENT OF THE ECONOMIC IMPACTS OF OCS ENERGY DEVELOPMENT

1st OCS Year
(Task 8.7)

Prepared by

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October 1977

The preparation of this report was financially aided through a Federal Grant from the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration under the Coastal Zone Management Act of 1972, as amended, Grant #04-5-158-50002

This report was prepared for the New York State Department of State

PREFACE

This report focuses upon the potential implications for marine related recreational activity on the south shore of Long Island and to the State's Atlantic commercial fisheries of prospective Outer Continental Shelf (OCS) energy development activities. The characteristics and economic importance of these activities are briefly inventoried. Assessment is then made concerning the potential adverse effects of OCS activities on recreational expenditures, commercial fisheries harvests and related economic ramifications.

Information concerning the prospective character and magnitude of OCS related energy development activity contained in this report was based upon material and information published in New York State and Outer Continental Shelf Development - An Assessment of Impacts, New York State Department of Environmental Conservation (October 1977). Extensive use was made of the material prepared by the State Office of Parks and Recreation and Long Island State Park and Recreation Commission in their study, Assessment of Impacts of Proposed Activities on Long Island's Shoreline Recreation Industry (June 1977) completed under task 8.8 of the OCS work program.

This report covers one of three elements of task 8.7 (Economic Impacts) of the OCS Work Program. Separate reports have been prepared covering the potential economic benefits from attracting OCS related onshore activities to New York and the potential contribution of OCS oil and gas resources in meeting future state energy needs.

All three reports provide information and assessments necessary to judge the overall economic implications - potential costs and benefits associated with exploration, development and recovery of OCS energy. They can serveserve as a basis for federal, state and local planning efforts to maximize the economic benefits of OCS activity while recognizing the need to minimize any adverse environmental ramifications.

OCS energy development activities are only in the formative stages. Major uncertainties exist with respect to the magnitude of the recoverable resources, the means to be utilized to transport the resources to onshore locations and a wide range of prospective environmental interactions. The findings contained in this report are based upon the best currently available information and reasonable judgements.

While the intent is to identify potentially significant adverse economic impacts, their occurrence will be dependent upon still unforeseen conditions. Appropriate planning could minimize many adverse environmental/economic impacts. To this end, the report should serve to stress the importance of implementing policies to protect the marine environment against any prospective OCS activities.

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PART I: INTRODUCTION AND FINDINGS

A. THE ECONOMIC IMPORTANCE OF MARINE RELATED ACTIVITIES

Recreation

Marine related recreational activity on the south shore of Long Island and New York City directly generates over $460 million in annual expenditures for goods and services. A whole array of business and individuals provide facilities and services for public beach visitors and tourists, private beach and recreation club members and persons engaged in boating and sports-fishing pursuits. This sectors viability in turn supports other businesses in the New York Metropolitan Area and as a result almost $1.2 billion is generated directly, indirectly and induced from recreational activity on the south shore (see Table 1).

The unique natural resources and manmade marine facilities on the south shore, 150 mile of ocean front with 38 major beach areas and over 500 marine facilities, its proximity to 11.5 million people in the metropolitan area and its attraction to tourists makes it the most heavily utilized oceanfront real estate on the Atlantic coast. During the peak summer season close to 50 million visitations are made to the public beaches in New York City, Nassau and Suffolk counties. Almost 850,000 sports fisherman annually fish off the shore and on a good summer weekend day, as many as 10,000 motor and sail boats may be offshore.

This unique and valuable marine environment is not only recognized at the state and local level, but also by the federal government. The Fire Island National Seashore was established in 1964 and in 1972 the National Gateway Park, the first major urban Federally administered recreational area, was established. Numerous State Parks, with Jones Beach the most well-known, are located along the 150 miles of oceanfront.

Table I-1

Current Annual Expenditures Associated with Marine Recreational Activity on the South Shore

	Expenditures for Goods and Services ($millions)
Beach Visitations and Tourism	$ 245
New York City ($48m)	
Nassau and Suffolk Counties ($197m)	
Sport-Fishing	92
Boating	82
Private Beach Club Membership	40
Total Direct Expenditures	$ 463
Direct, Indirect and Induced Expenditures	$1,160[1]

[1] Based upon a regional multiplier of 2.5 applied to direct expenditures

Sources: New York State Department of Environmental Conservation and the Long Island State Park and Recreation Commission

Recreation on the south shore is primarily a summar activity, concentrated during the 18 week season stretching from mid-May through mid-September. Therefore, for the bulk of the recreational oriented businesses, a limited span of time principally determines their annual income prospects. An estimated 85 percent of total annual recreational expenditures occurs during the summer season.

While almost all of New York City's and Long Island's shore front serves some form of public and private recreation, there are different patterns of use that result in different expenditure characteristics within geographic sub-areas. For example, Coney Island, the Rockaways and the beaches in Nassau County usually are more crowded and tend to have primarily day-use visitors. Suffolk County beaches especially the more eastern ones are generally less crowded and used by weekenders and vacationers. These latter groups often occupy motel rooms and seasonal homes and as a result spend more per-capita than day-use visitors.

Commercial Fishing

Commercial fishing off the south shore is part of the complex of businesses and activities comprising the Metropolitan area's seafood industry that includes: harvesting, processing, wholesale distribution and retail sales. This industry is only partially dependent upon fish harvested in or near New York waters with greater reliance on other domestic fisheries and foreign sources. Indeed, these latter sources comprise the overwhelming bulk of fish products processed and wholesaled in the Metropolitan area.

The overall dollar value of some of the components of the Metropolitan Area's seafood industry are as follows:

	Estimated 1976 (millions)
Value of Dockside Commercial Landings in New York State	$ 32
Value of Processing Activities	93
Wholesale Trade Establishment Sales	364
Retail Seafood Market Sales	96

Sources: See Part II and appendix material

The harvesting of commercial fisheries off New York State shores is potentially sensitive to OCS energy development activities and therefore, this report concentrates on assessing the characteristics of this function and the potential consequences of OCS activity.

New York's commercial fishing is principally dependent upon high value shellfish resources located in and around the bays, sounds and inlets and near-shore ocean waters. These resources represented in 1976, 85% of the total landing values with hard clams being the most important species, representing about 25% of the total poundage and over 50% of the value. Suffolk County is the main location of landings and accounts for over 75% of the state's total marine landings, with Nassau having 15% of the total.

Employment associated with marine commercial fishing is estimated at 9,500 with, however, two-thirds being part-timers, reflecting the seasonality of the industry and its inability to provide for year round employment.

B. PERSPECTIVES ON OCS DEVELOPMENT

As a result of current U.S. Department of Interior lease sales in the Mid and North Atlantic Outer Continental Shelf (OCS) within the next few years there will be a determination of the amounts of potentially recoverable oil and gas resources. The finding of economically recoverable resources

will mean that major activity associated with development and production of energy could commence by 1980 in offshore areas within 100 miles of the state's shores (see map 1).

In assessing the potential environmental, economic and energy impacts and implications of OCS energy development for New York State, three scenarios were postulated by DEC with respect to the amount of recoverable resources. These scenarios are not meant to be predictions, but rather assumptions using the best available information to identify a range of possible resource finds. The three resource finds are a high oil and gas find, a very high gas find, and a low oil and gas find. Potential yields for each scenario for the Mid-Atlantic and North Atlantic OCS areas are contained below in Table 2.

Table I-2

Potential Resource Finds'
Mid-Atlantic and North Atlantic

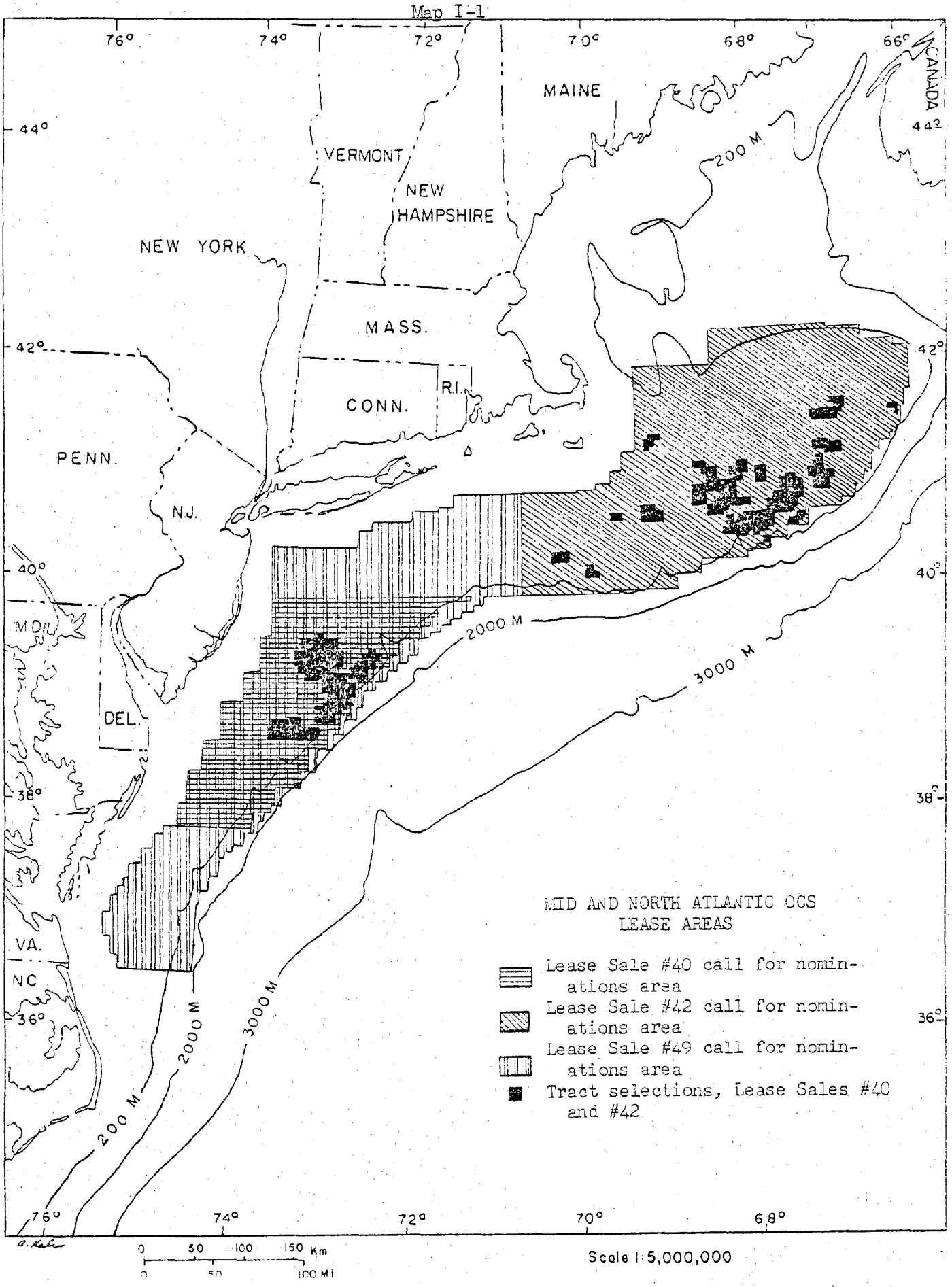
Scenarios	Mid-Atlantic		North Atlantic		Total	
	Oil	Gas	Oil	Gas	Oil	Gas
#1 high oil and gas	2.6	12.8	0.9	4.2	3.5	17.0
#2 very high gas	0	30.0	0.9	4.2	0.9	34.2
#3 low oil and gas	0.4	2.6	0	0	0.4	2.6

Note: Oil quantities are noted in billions of barrels. Gas quantities are noted in trillions of cubic feet.

Source: New York State and Outer Continental Shelf Development-An Assessment of Impacts, New York State Department of Environmental Conservation (October, 1977).

The recovery of oil and gas from the OCS will require major investment in offshore and onshore facilities. Rigs, platforms and pipelines will be put down offshore and tankering operations may be required to transport oil to coastal landing sites. Onshore support activities including service

Map I-1


76°
74°
72°
70°
68°
66°
CANADA
MAINE
44°
VERMONT
NEW HAMPSHIRE
NEW YORK
200 M
MASS.
42°
CONN.
R.I.
PENN.
N.J.
40°
MD.
DEL.
2000 M
3000 M
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NC
36°
MID AND NORTH ATLANTIC OCS
LEASE AREAS
Lease Sale #40 call for nominations area
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bases, platform fabrication yards, energy processing plants and a range of other facilities will be needed along the Atlantic Coast. All told, the discovery of significant resources will mean the advent of new industry bringing both opportunities and potential problems for New York and other Northeast states.

OCS activity will occur within a marine environment that is a major economic asset to New York and other states. Commercial fisheries of the North Atlantic are one of the major world food sources. The coastal shorefront from Maine to Virginia provides to the 50 million inhabitants of the Boston to Norfolk megolopolis, access to a unique recreational resource. This OCS environment is likely to be highly suceptible to adverse impacts from the integration of OCS energy recovery activities within its perimeter.

Marine fisheries could be impacted by competition for space in fishing grounds that contain platforms, rigs and pipelines. Oil spills could have immediate and long-term detrimental impacts on fisheries and if they reach shore, severe consequences for shoreline recreation activities. The utilization of the beaches, boating activity and sportfishing could be dramatically curtailed and substantial economic losses suffered in the event of major spills.

The Nature of Prospective OCS Activity

There are four major phases associated with OCS energy recovery activities after lease sales by the U.S. Department of Interior.

- Exploratory Phase
- Development Phase
- Production Phase
- Shutdown Phase

Exploratory activities are conducted by the petroleum companies to determine whether oil and gas resources are actually present and to delineate the size and extent of any resources that may exist. Exploratory rigs, designed to be easily moved from one location to another drill wells to determine hydrocarbon resource characteristics. This information is used to plan the timing and scale of development operations.

The number of wells drilled is determined by the amount of resources present and exploration may continue well into the development phase if substantial finds are identified. If non-commercial finds are only encountered, their exploration may cease within five years or less. Exploratory activities generate a limited amount of onshore support requirements, primarily support from temporary service bases.

In the development phase, production platforms are installed and onshore support operation established. Each production platform is installed for the life of a field and each will support one or more drilling rigs. A drilling rig can drill four or more wells per year and the number of development wells may reach 20 or more per platform.

During this phase, decisions are made concerning the means by which OCS oil and gas resources are transported to shore. Either pipeline or tankers will be used, depending upon economic, technological and environmental considerations including the total amount of resources, expected rates of production and prospects for adverse environmental impacts from transfer operations. For gas, pipelines are the only economically feasible means of transfer since the alternative, liquefying the gas at the platform and shipping it by (LNG) tanker will not be economically advantageous in the Atlantic OCS.

With respect to the transport of oil recovered from the OCS leasing areas, a sufficiently large oil find will economically justify the construction of a pipeline. A small find will make the use of tankers more economically attractive. The use of tankers is likely to incur much greater environmental risks as a result of loading from the platforms, potential tanker spills in transit and accidental spills during shore unloading.

The development phase of OCS generates substantial onshore and offshore activity and employment peaks with the need to fabricate platforms, install pipelines and commence operations of permanent OCS service. It is at this stage that all the necessary infrastructure must be in place to enable production and recovery of oil and gas.

The production phase may overlap both the exploratory and development phases. During this phase which may last 10-20 years the level of onshore support activity is well below that experienced during development. In the overall production phase, because of phased drilling of wells, production rates at any given time will vary among different fields. However, because of technological requirements, the overall pattern for a group of fields is for a rapid rise of production followed by constant decline.

The economic limits of production in any reservoir field is a function of complex physical and economic factors. Generally, primary recovery leaves substantial resources in place which are uneconomical to recover. Secondary and tertiary recovery techniques exist, however, they are expensive. They would extend production of OCS lease areas and fields but at this point, too many unknown factors exist to assess prospects for secondary and tertiary recovery from OCS lease areas.

The shutdown phase occurs when the fields reach economic exhaustion. At this point, wells are plugged, production platforms are removed and pipelines are abandoned.

Not withstanding the potential substantial energy and economic benefits to the nation, northeast and New York State of OCS oil and gas resources, the exploration, development and recovery of these resources could have adverse environmental and economic effects. These implications for New York's marine activities are summarized below and detailed further in Part II.

C. FINDINGS ON THE POTENTIAL IMPACTS

OCS development can adversely affect both the offshore and nearshore marine environment and may cause conflicts with commercial fishing and marine recreational activities on the south shore. Negative economic consequences for these sectors could therefore occur. However, the most significant detrimental effects would not be inherent in day-to-day OCS energy development activities. The issue of adverse environmental consequences that could cause major economic losses is principally associated with the random event of a major oil spill, especially one occurring near the shoreline.

Normal ongoing OCS operations, both onshore support activities and at offshore facilities should not present conflict problems with marine recreational pursuits. The OCS lease areas are well offshore and any major onshore facilities that New York State attracts are not likely to be located near major shorefront recreational areas. As a result, it is difficult to envision circumstances where ongoing OCS activities would adversely affect recreational expenditures and thereby cause losses in business income and employment opportunities.

OCS offshore operations may lead to some conflict situations with respect to commercial fisheries harvests by New York State based fleets. However, under current harvesting operations, these conflicts would only affect minor segments of the industry. The bulk of the industry-measured by the volume and value of landings - harvests shellfish and finfish species from waters within 12 miles of the south shore. If however, the State's

commercial industry expands to species and locations well offshore, as a result of the protection afforded by the newly extended U.S. 200 mile fisheries jurisdiction, relatively greater conflict prospects may develop.

Currently uncertainties, concerning the specific prospects for expansion of commercial fisheries, the severity of potential friction with OCS activities, and the feasibility of ameliorative actions makes it impossible to identify the nature and magnitude of prospective adverse economic consequences.

The most detrimental aspect of OCS development appears to be the possibility of both major and minor oil spills. According to information to date, pipelines will probably be utilized to transport oil from the Baltimore Canyon (Mid-Atlantic) leasing areas to the shore. In the case of the Georges Bank (North Atlantic) however, tankers will most likely be used to transport oil to refineries in the Mid-Atlantic. Because tankers are environmentally more dangerous, there has been great concern that the additional tanker traffic may subject Long Island's south shore to a high degree of risk.

Tanker traffic from the Georges Bank would use sea lanes close to Long Island shore points such as the Nantucket/Ambrose traffic lane. Oil spills along this location have a high probability of stranding on the shorefront and thereby affecting recreational activity. Close in spills and major offshore spills reaching the bays and inlets of the south shore could severely impact commercial fisheries.

The worst economic losses would be suffered from a spill occurring during the summer season, the peak period for beach activities, boating and sportsfishing as well as commercial fisheries harvests. Specific study findings with respect to the economic related implications of a major oil spill for

the marine recreational sectors and the commercial fishing industry occurring during a typical July are as follows:

- Average direct weekly losses in recreational expenditures ranging from between $2 and $13 million, depending upon the location of the impacted shore area.
- Average direct weekly losses in gross revenues to commercial fisherman of $50,000 to $500,000 if harvests are reduced between 5% and 50% respectively.
- Relative declines in the above harvests would translate into economic losses of seafood products, valued at the retail level, of between $130,000 and $1.3 million.

The figures above represent values at 1976 conditions. They do incorporate projected increases in marine recreational activity, growth in per capita expenditures nor the increasing value of seafood products or considerations regarding future harvest levels. Therefore, the economic losses noted above are conservative estimates.

The fact that substantial aggregate dollar losses would result from a major oil spill, doesn't provide a picture of the complete socio-economic consequences. Marine recreational oriented services and commercial fishing operations are typically small businesses, often family operated. The loss of significant income for these types of businesses for even a week cannot be easily absorbed. Prolonged business declines beyond a week, which could very likely occur as a consequence of a major spill, would have severe implications for maintaining the viability of individual business operations and their work forces.

PART II: INVENTORY AND IMPACT ANALYSIS

A. SHORELINE RECREATION

The south shore of New York City and Long Island provides a unique environment for marine recreational activity - swimming, boating, sports-fishing and related pursuits. Located in the heart of the most concentrated center of population and economic activity in the nation, the shore is an irreplacable resource, serving the recreational needs of the 11.5 million inhabitants of the New York Metropolitan Region and countless domestic and foreign tourists and visitors. The shoreline is also abundant in shellfish resources, the principal money harvest of New York's commercial fishing industry based on Long Island.

The uniqueness and value of the marine environment is not only recognized at the state and local level but, also by the Federal Government. The Fire Island National Seashore was established in 1964 and in 1972 the National Gateway Park was established, the first major urban federally administered recreational area. Numerous State parks, with Jones Beach the most well-known, are located along the 150 miles of oceanfront.

The figures on the use of the natural resources and marine facilities affirm the attraction and importance of this area for recreation and tourism. The 38 major southshore beaches attract 60 million annual visitations. On an average summer day, those in Nassau and Suffolk have 233,000 visitations while double this number may utilize New York City's famous Coney Island and Rockaways Beaches. Additionally, many hundreds of thousands use over 500 marine facilities (marinas public and private docks, and ramps) for boating and sportfishing activities (see table 1).

As a result of being a major attraction for recreational pursuits and related tourism for Metropolitan area residents and visitors, the shoreline is an important economic asset. Currently over $460 million annually is

Table II-1

New York City and Long Island South Shore Marine Related Resources and Indicators of their Utilization

I. Shoreline		
Acres of Tidal Marshlands		25,000
Miles of Ocean Front		149
Major Beach Areas		38
·Nassau-Suffolk	(30)	
·New York City	(8)	
Annual Beach Attendance		60 million
·Nassau-Suffolk	(38 m.)	
·New York City	(22 m.)	
Average Summer Day Attendance ·(Nassau-Suffolk Beaches)		233,000
Number of Marine Facilities (Marinas, public and private docks, ramps and fishing stations)		512
·Nassau-Suffolk	(416)	
·New York City	(96)	
Private Beach Clubs ·(Nassau Suffolk)		120
II. Marine Recreation		
Registered Motor and sail boats		100,000
Number of Primary Sports-fisherman		845,000
·New York State Residents	(735,000)	
·Out of State	(110,000)	
Total Annual Recreational Fishing Days		6,760,000

Sources: New York State Department of Environmental Conservation and Long Island State Park and Recreation Commission

directly spend on recreational goods, services and fees. This supports many large and small business enterprises and provides about 50,000 permanent and seasonal jobs. These expenditures result in significant indirect and induced dollar income flows amounting to about $700 million for the Metropolitan economy. Thus in total, south shore marine recreational activity generates almost $1.2 billion for the Region's economy.[2]

Beach visitations and related tourism accounts for most of the $463 million annual direct expenditures - about $250 million with 80 percent spent in Nassau-Suffolk and 20 percent in New York City. Sportfishing by the almost 850,000 anglers generates $90 million annually in direct trip related expenditures. General boating activities and participation in south shore private beach and recreation clubs account for over $120 million.

Recreation on the south shore is primarily a summar activity. Most of the participation and visitation occurrs during the 18 week season stretching from mid-May through mid-September. As expected, the bulk of the related expenditures and the economic impact is experienced during this period. Table 2 totals indicate that about $350 million, 85 percent of total annual expenditures take place during the summer season.

While all of New York City's and Long Island shorefront serves some form of public and private recreation, there are different use patterns along various stretches. For example, Coney Island the Rockaways and the beaches in Nassau County are more crowded and tend to have primarily day-use visitors. Suffolk County beaches, especially the more eastern ones, are generally less crowded and used by weekenders and vacationers. These latter groups rent motel rooms and seasonal homes and therefore spend more per-capita than day-use visitors.

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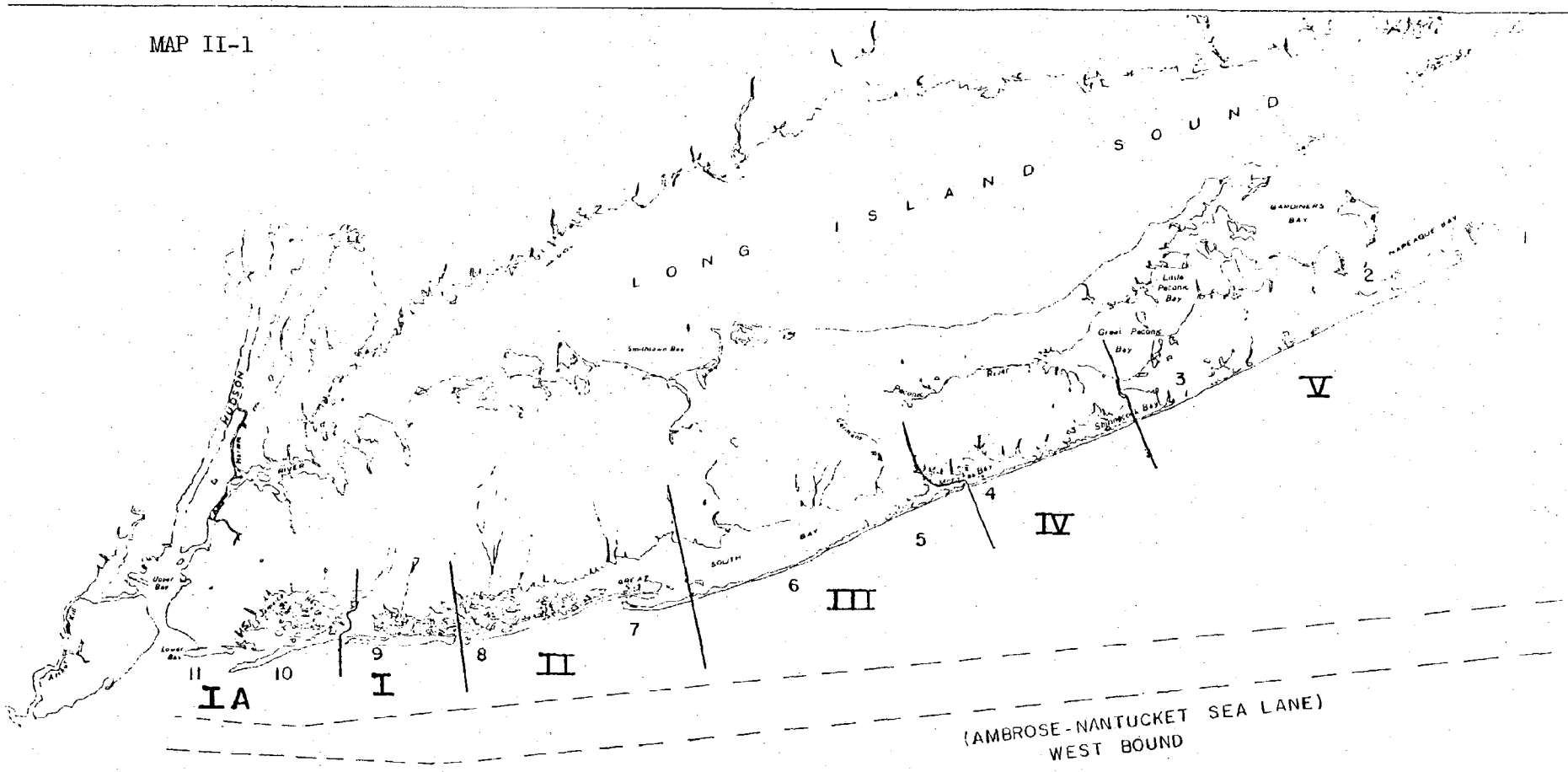
[2]Estimates developed by Long Island State Park and Recreation Commission and New York State DEC OCS Program. Data sources are provided in accompanying tables and supporting documents.

MAP II-1



COASTAL RECREATION SECTORS

IA. Coney Island - Rockaways
I. Western Nassau
II. State Park Region
III. National Seashore Region
IV. Westhampton - Tiana Beach
V. The East End

Source: Long Island State Park and Recreation Commission

A breakdown of Long Island's south shore into coastal recreational sectors has been developed by the Long Island State Park and Recreation Commission. This is shown on Map 1 and characteristics of these sectors, with respect to facilities, seasonal attendance and expenditures are indicated in table 2. This locational information will be the basis for identifying potential economic losses resulting from OCS energy development activities.

Potential Impact of OCS Activity

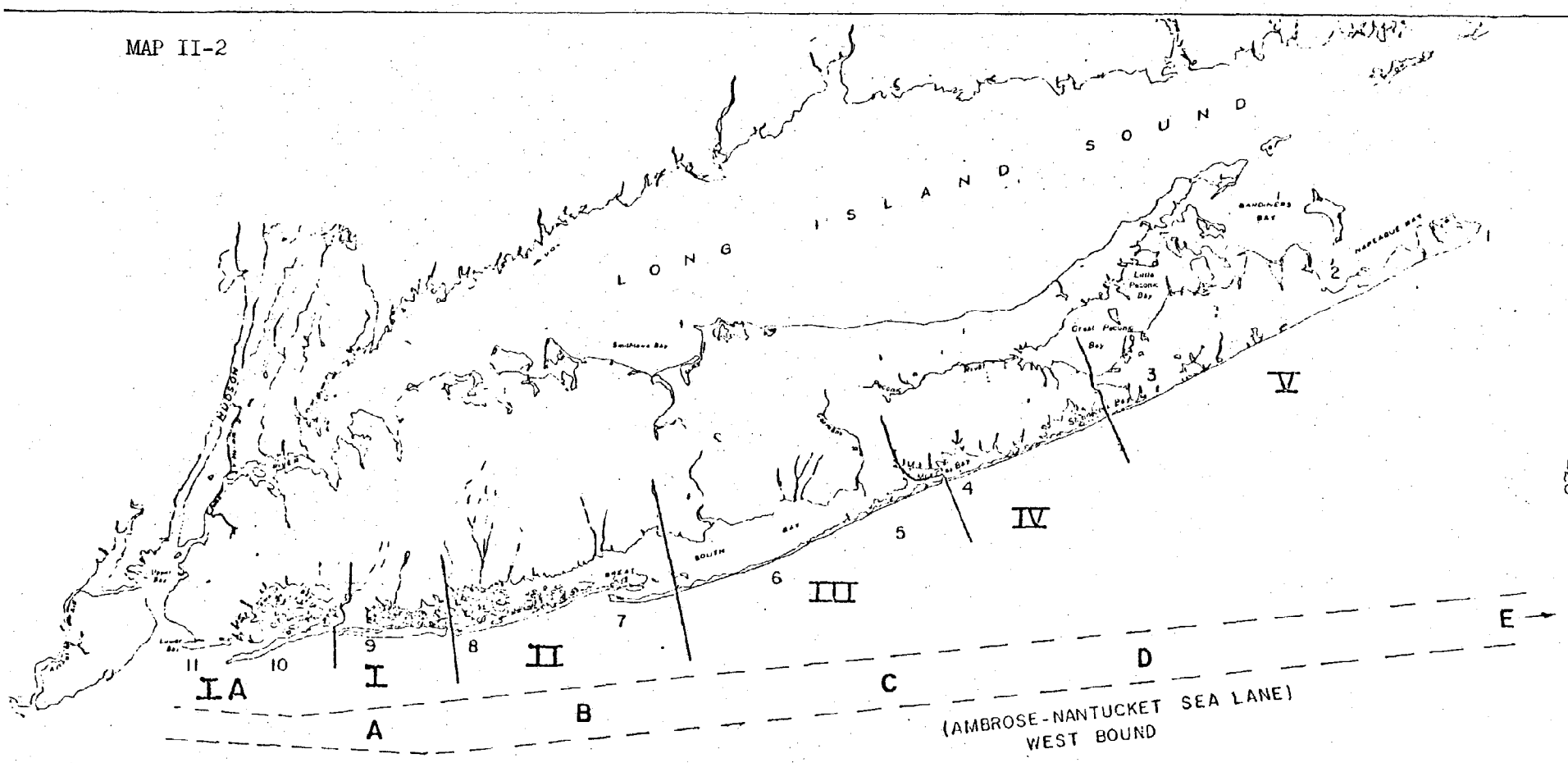
The Long Island State Park and Recreation Commission has developed economic impact information concerning the consequences of possible oil spills reaching various locations along the south shore. They hypothesized five medium and large spills at different locations along the Ambrose-Nantucket Sea Lane, as identified on Map 2. The sea lane is an established route for tankers bringing crude oil and petroleum products into the New York-New Jersey Port area.

Proposed OCS oil development in the North Atlantic Georges Bank lease area could result in the tankering of crude oil from offshore to refineries located in Northern New Jersey via the Port of New York. The routes used, such as Ambrose-Nantucket, pass close to the Long Island's south shore as noted on map 2. Currently, about 800 ships use this route, presenting dangers of spills to Long Island even without OCS development.

OCS oil development from the Baltimore Canyon lease area is likely to be transported by pipeline to land sites on the New Jersey Coast. Therefore there would not be the issue of tanker spills from that lease area. Oil spills occurring within the lease areas, from platform blowouts or tanker loading operations, have very low probabilities of reaching the south shore according research utilizing mathematical spill models. Therefore, they are not considered as much a danger to shore resources and economic activity.[3]

[3]Major spills at sea could have very adverse impacts on fisheries. This will be discussed in Section C.

MAP II-2



HYPOTHETICAL OIL SPILL LOCATIONS (A-E)

Proximity of Sea Lane to Points Along Ocean Shore

1.	Montauk Point - 34 miles	6.	National Seashore - 8 miles
2.	Napeague Harbor - 30 miles	7.	Robert Moses State Park - 7 miles
3.	Southampton - 23 miles	8.	Jones Beach State Park - 7 miles
4.	Moriches Inlet - 18 miles	9.	Atlantic Beach - 7 miles
5.	Smith Point Beach - 14 miles	10.	Rockaway Beach - 6 miles
		11.	Coney Island - 3 miles

Source: Long Island State Park and Recreation Commission

Table II-2: Characteristics of Long Island's South Shore by Coastal Recreational Sectors

Sector	Miles of Ocean Front	Number of Beaches	Number of Marine Facilities	Average Daily Attendance[2]	Seasonal Attendance[3] (millions)	Seasonal Expenditures[3] ($ millions) Total	Beach Visits and Tourism	Boating & Sports fishing
I- Western Nassau	13	21[1]	107	45,000	5.6	38.8	4.5	34.3
II- State Park Region	26	7	120	89,000	11.0	52.8	8.9	43.9
III- National Sea Shore	31	17	62	22,000	2.7	38.1	22.2	15.9
IV- West Hampton-Tiana	18	18	56	27,000	1.5	51.9	33.5	18.4
V- The East	45	29	71	50,000	6.2	164.8	124.0	40.8
Total	133	92	416	233,000	29.0	$346.4	$193.1	$153.3

1/ The City of Long Beach has 32 small beaches, they are counted as 1 in this table
2/ On a Summer day
3/ 18 week season from mid-May to mid-September

Source: "Assessment of Impacts of Proposed OCS Activities on Long Island's Shoreline Recreation Industry" Prepared by the L.I. State Park and Recreation Commission under New York State CZM/OCS Program (June 1977)

Spill Assumptions, Characteristics and Locations

It was determined that oil spills occurring at random points along the Ambrose-Nantucket route during the summer months would very likely wash ashore Long Island beaches within a period of 2-10 days.[4]

Oil spill scenarios for the locations noted on map 2 were developed for medium and large volume spills.[5] It was estimated that a medium spill could potentially impact a 20 mile length of shoreline and a large spill, 60 miles.

The impact analysis assumed that all of the spills would occur during the second half of June. This represents the worst condition because it would effect the peak July 4th summer recreational period.

The five spill locations, A through E identified on Map 2 for a medium and large volume spill would have the following onshore impacts.

Onshore Impact Areas (West to East)

	Distance From Shore (Miles)	Medium Spills	Large Spills
Spill A	7-8	Atlantic Beach - Ceder Beach	Atlantic Beach - Western end of Smith's Point Park
Spill B	7-8	Long Beach - Gilgo Beach	Atlantic Beach - Smith Point Park
Spill C	8-9	Robert Moses State Park Western and Smith's Park	Atlantic Beach - Smith's Point Park
Spill D	20	Smith's Point Park - Quoque Beach	Eastern Jones Beach - Quoque Beach
Spill E	26-28	None expected	Moriches Inlet - Montauk Point

[4]Based upon spill trajectory studies prepared for the Nassau-Suffolk Regional Board by MIT's Department of Ocean Engineering under the OCS program.

[5]Utilizing U.S. Coast Guard standards of 500-1,000 barrels for medium spills and over 1,000 barrels for large spills.

In estimating the impact areas and resultant economic losses, the following assumptions were made by the Long Island State Park and Recreation Commission:

- Medium spills at the various locations could impact about 20 miles of beach front
- Large spills at these same locations could impact around 60 miles of beaches
- Impacted beaches will be completely closed for periods of 1-4 weeks
- There will be 100 percent diversion of potential beach users to outside Nassau-Suffolk during this period. There will be no money expended by beach visitors in the impacted area.
- Losses of 10-30 percent in expenditures for the sportsfishing and boating components of the recreation industry. This was based upon the Commission's study of the economic impact of the June 1976 waste pollution wash-up on Long Island's beaches.

Economic Losses

Table 3 summarizes the findings concerning the economic consequences of the hypothesized spills. The economic losses are based upon estimates of the total weekly recreational expenditures for the on-shore impact areas identified above. The losses represent estimated low and high ranges for both medium and large spills originating from the five Ambrose-Nantucket spill locations.

The range of economic losses would be substantial. A large spill at location E would cause the most extensive dollar damages, between $9-13 million in direct recreational spending. A medium spill at location E would however, not have appreciable impact. A medium spill at location A would have the smallest dollar loss, less than $1 million.

Table II-3: Economic Impact of Oil Spills Reaching Long Island Shore Areas: Weekly Lossess During Peak Summer Months

Illustrative Offshore Oil Spill Locations (See maps)	Weekly Recreational Expenditures in Impacted Area (see maps) ($ Millions)	Range of Likely Weekly Expenditure Losses ($ Millions)
Large Spill at Location A	7.4	2.0 - 3.6
Large Spill at Location B	6.5	1.7 - 3.1
Large Spill at Location C	7.4	2.0 - 3.6
Large Spill at Location D	8.5	2.7 - 4.4
Large Spill at Location E	23.7	8.9 13.3
Medium Spill at Location A	2.0	0.4 - 0.9
Medium Spill at Location B	2.5	0.6 - 1.2
Medium Spill at Location C	2.9	1.2 - 1.7
Medium Spill at Location D	3.6	1.6 - 2.2
Medium Spill at Location E	No impact	Negligible

Source: Long Island State Park & Recreation Commission

The broader economic implications of the losses presented in table 3, should be noted. The direct losses in recreational spending would not only impact directly involved recreational businesses, but also have "ripple effects" for the entire regional economy. Indirect and secondary impacts occur especially on Long Island.

Many individuals and businesses within the southshore recreation related industries - concessionaires, motel operators, sports fishing and boating supply shops - could suffer extensive losses that might mean a collapse of their business. Given the short season upon which their annual revenues depend, and the generally small size of the enterprise, many couldn't absorb the losses resulting from extensive reductions in tourism and recreational activity.

A spill early in the season could set the business tone for the whole summer by detering later visits and trips to the South Shore. While an actual spill might restrict beach use to a limited period, it could have the psychological impact of reducing south shore recreation over an entire summer season.

Other economic and social consequences of prospective oil spills are difficult to measure, yet could affect the welfare of individuals, businesses in the region and communities along the south shore. These concerns include:

- The displaced recreational opportunities for hundreds of thousands which would represent a significant "psychic income loss"
- The depreciated value of water-front property because of potential exposure to oil spill dangers and effects.
- The diminished high level aesthetic values and environment typical of many southshore communities.

The OCS oil spill analysis represents hypotheses about possible future random events and therefore the economic consequences are probalistic not planned certainties. However, events such as these do however happen with too much frequency. The Santa Barbara oil spill of 1969 and the recent Argo Merchant disaster off the Georges Bank near Cape Cod are but two of these recent occurrences.

Closer to home, the June 1976 fouling of Long Island beaches as a result of the wash-up of sea-borne debris and organic wastes, dramatically documents the economic impact of environmental disasters. A total of 68 miles of south shore beaches were affected over an 18 day period resulting in multiple closings of about 20 major beaches. As a result, there was a loss of $25 million to the recreational industry on Long Island.[6]

If future significant OCS related oil spills do occur and they reach shore areas, there will be tangible and unfortunately substantial environmental and economic damages.

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[6]Described and documented in detail in the following reports: Long Island Beach Pollution: June 1976, Report coordinated by the National Oceanic and Atmospheric Administration (February 1977); Report to Governor Hugh L. Carey on the 1976 Fouling of Long Island Beaches, N.Y. State DEC (Feb. 1977) and Long Island Waste Pollution Study An Economic Analysis, L.I. State Park and Recreation Commission and NYS Office of Parks and Recreation (Nov. 1976).

B. SPORTS FISHING[7]

Marine sports fishing off the south shore of New York City and Long Island is a major recreational and income generating activity. It provides enjoyment to hundreds of thousands and supports a major segment of the marine facilities and service industry. The sports angler, also catches fish in substantial amounts and this too is important with respect to its value as a food source.

Currently there are an estimated 845,000 persons (including about 170,000 non-state residents) who are hard core sports anglers who fish an average of 8 days per year off the shore. In 1976 these anglers generated an estimated $96 million in direct expenditures for goods and services, and caught enough fish to equal $50 million in retail seafood products. In the aggregate, the recreational value to these anglers is estimated at $75 million in 1976 (see tables 4 and 5 and appendix material). In addition to the prime anglers who spend an estimated 6.8 million days annually fishing, there may be over twice as many persons occasionally participating in sports fishing off the south shore.

Sports fishing mostly occurs along the shallow bays and sounds that are found along the south shore rather than the ocean proper. A significant minority, perhaps as much as 30-50% utilize shore beaches, banks, jetties or bridge piers. The majority however utilize charter, rental and self-owned boats with a segment of these groups engaging in deep sea fishing. Comprehensive data on sports fishing off the south shore is lacking, but, probably closely parallels the pattern for the northeast indicated in table 6.

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[7]The economic loss estimates in the previous section included those associated with sportsfishing. However, the importance of this activity and the potential adverse impacts of OCS activity on fisheries calls for a more in-depth assessment.

TABLE II-4 : ECONOMIC BENEFITS ASSOCIATED WITH MARINE SPORTS FISHING OFF THE SOUTH SHORE OF NEW YORK CITY & LONG ISLAND: 1976

(In $ Millions)

	Annual 1976	Seasonal Distribution* Summer	Fall	Spring	Winter
Direct Angler Expenditures for Goods & Services	$ 95.8	$ 67.1	4.8	23.9	**
Value of fish as Food (Retail Prices)	50.7	35.5	2.5	12.7	**
Benefits of Recreating	74.4	52.1	3.7	18.6	**
Addendum:					
Angler-Recreating Days (000)	6,760	4,732	338	1,690	**
Number of Anglers	845,000				

*Distribution represents general seasonal variation rather than specific 1976 pattern.

**Assumed to be insignificant.

SOURCE: See tables to follow & appendix material.

Table II-5: SELECTED SUMMARY INDICATORS ON MARINE SPORTS FISHING OFF SOUTH SHORE OF N.Y. CITY & LONG ISLAND: 1976

Indicators		Source
(1)	Primary Anglers - 845,000	See Appendix
(2)	Total Annual Angler Expenditures for Goods & Services - $ 95.8 million	(1) x (3)
(3)	Average Annual Expenditure per Angler - $ 113	See Appendix
(4)	Average Annual Recreating days per angler - 8	Average for all U.S. Salt-Water fisherman is 12 (From 1970 National Survey of Fishing & Hunting). Reduced to 8 for N.Y. State.
(5)	Average Expenditure Per Recreating day - $ 14	(3)÷(4)
(6)	Distribution of Recreating Days by Season Annual Total - 6,760,000	Based upon Middle Atlantic States pattern for all recreational fishing adjusted to N.Y. State conditions

	Summer	Fall	Spring	Winter
percentage	70	5	25	Negligible

Table II-6

Distribution of Recreational Fisherman: 1970
(percentage)

Location	Ocean	Sound Rivers & Bays
	41	59
Method	From Boats	On Land
	62	38

Source: Marine Recreational Fishing in New York and New England, 1970 Salt-Water Angling Survey (U.S. Department of Interior)

Sports fishing in New York waters is primarily a summer activity. An estimated 70% of the recreating days occurs then, while the spring season accounts for 25% and the fall/winter months constitute the remaining 5% (see table 5). Therefore, the economic impact of this activity is highly seasonal, being concentrated in the summer months.

Potential Impact of OCS Activity

Normal OCS energy exploration, development and recovery activities are not likely to conflict with the majority of sports fishing activity. Both the Georges Bank and the Baltimore Canyon lease areas are located well beyond (over 75 miles) the waters that account for almost all sports fishing. Only if OCS operations significantly impact the fisheries resources of the mid and north atlantic, would there be adverse impacts and associated economic consequences from curtailment of sports fishing activity.

A critical factor would however be the impacts of oil spills reaching shoreline areas. A major spill of this type in the summer season could drastically reduce recreational fishing and cause severe adverse economic losses to sports anglers and the onshore marine industry. Even minor spills

TABLE II-7: ILLUSTRATIVE ECONOMIC VALUES AND POTENTIAL LOSSES:

(AVERAGE WEEK IN PEAK SUMMER SEASON)

ASSOCIATED WITH LOST OR DISPLACED

ANGLER DAYS

	Average Weekly Angler Days	Average Weekly Economic Benefits ($millions)*		
		Angler Expenditures for Goods & Services	Value of Fish as Food	Recreating Benefits
Total Values	364,000 [1]	$ 5.1 [2]	$ 2.7 [3]	$ 4.0 [4]

Assumed Recreating Days Lost		Average Weekly Economic Losses ($millions)*		
Percent:	Number			
5%	-18,200	-0.3	0.1	0.2
10%	-36,400	-0.5	0.3	0.4
20%	-72,800	-1.0	0.5	0.8
50%	-182,000	-2.6	1.4	2.0

*Rounded to nearest hundred thousand

1] Summer season angler recreating days, 4,732,000 divided by 13 weeks.
2] Average weekly angler days x $14.00 (Average expenditure per angler day)
3] Average weekly angler days x $7.50 (Average value of anglers day food catches)
4] Average weekly angler days x $11.00 (Average angler-day recreating benefit)

NOTE: See appendix material for supporting data

close to shore would cause some economic dislocation. For example, the discouragement of a small number of anglers because of the "publicity" surrounding a minor contained spill would result in some economic losses.

Table 7 provides a means to assess the economic consequences resulting from lost or displaced sports fishing activity for a typical average week in the peak summer season. Even a "marginal" reduction of 5% in angler days translates into economic losses - $300,000 in angler expenditures for goods and services, - $100,000 in "lost" food value and - $200,000 in angler recreational benefits.

Although the information provided in table 7 represents hypothetical economic damages, it does illustrate that a reduction in angler activity due to an oil spill (or indeed any factor including natural causes such as bad weather) can have important negative economic consequences. With the anticipated growth of sports fishing over the next decade, economic losses associated with shore area oil spills in the peak summer months would be even greater than those shown on table 7.

The promotion of sports fishing is a major element in the current state/local coastal zone management planning program. The need to protect this activity from potentially damaging conditions from OCS activity deserves priority consideration.

C. COMMERCIAL FISHERIES

This section focuses upon the harvesting of fisheries in the Atlantic waters off the state, because of potential direct and adverse effects of OCS energy development activity. Commercial harvesting is however, only one of the integrated components in the state's larger and important seafood industry. An inventory of the economic dimensions of this overall industry is necessary to provide perspectives on the potential indirect as well as direct economic consequences of OCS activity.

Overview of the Seafood Industry

The seafood industry in the state and particularly in the New York Metropolitan Area is composed of businesses and activities covering the harvesting, processing, distribution and retailing of finfish and shellfish products with linkages to other states and foreign sources as well as within New York. Chart 1 provides a simplified diagram of the major segments of the industry and the value of their activities.

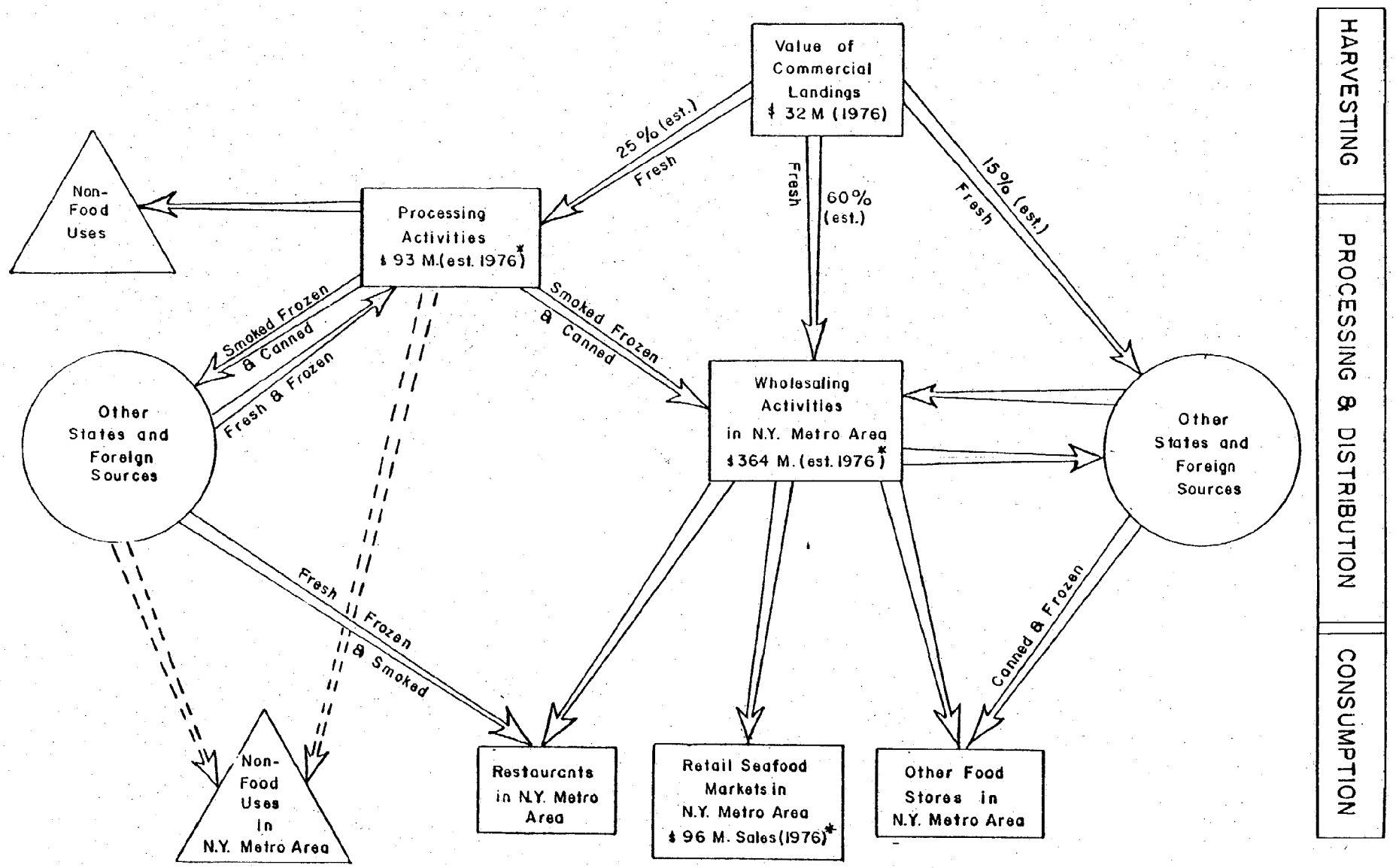
At the center is the wholesaling function which in 1976 accounted for an estimated $364 million in sales. The metropolitan area with respect to sales, is the nation's number one seafood distribution center. This pre-eminence is a result of both serving the latest and richest regional population market, and also a function of the area being a major transhipment center of domestic and imported fresh and processed products for states east of the Mississippi.

Only a small but important component of seafood wholesaled in New York is landed by New York State commercial fleets. As the chart indicates, commercial landings in 1976 were valued at $32 million at the dock (with an estimated wholesale value of $67 million). Wholesalers are overwhelmingly dependent upon products from other domestic and foreign commercial harvests.

The important seafood processing business in the state, with an estimated production value of $93 million in 1976 is highly specialized. About two-thirds of production is for very high priced products such as smoked fish, prepared shrimp and canned specialities for the in-state, principally the New York City market area. Processers are even more dependent upon sources of supply external to the state than wholesalers.

Consumers in the metropolitan area, through access to specialty retail seafood markets, ($96 million in estimated sales in 1976), supermarkets and restaurants have available, given the willingness to often pay premium prices, the widest range of seafood products available to the American public.

Chart II-1 NEW YORK'S SEAFOOD INDUSTRY: DIAGRAMATIC FLOW OF FISHERIES PRODUCTS



Source: See Appendix Tables

Commercial Fishing in New York State Marine Waters

New York's marine commercial fisheries harvest is predominately a high value product with shellfish, principally clams, oysters, scallops and lobsters in 1976 representing 85% of the total value of landings. The hard clam is the single largest species harvested and accounts for over 25% of the poundage and over 50% the value of landings. Flounder is the most important finfish, but only accounts for about 5% of the total value (see table 8).

While finfish landings are now of minor economic importance representing only half the weight of landings and less than 15% of the value, this was not always the situation. Twenty years ago, finfish represented well over 90% of the amount of landings and about half the value. Chart 2 dramatically illustrates the declining importance of commercial finfishing since 1956 and the rapid increase in the value of shellfish.

The changing composition of New York's commercial landings reflects the impact of economic and resource conditions; chiefly:

- The competitive decline in the economics of catching and processing in-state the low value consumer and industrial fishery products such as menhaden.
- The growing demand for high value shellfish by an increasingly more affluent and seafood oriented public.
- The declines in the supply of certain fisheries species due to extensive foreign catches off the New York and other northeastern states.[8]

Currently, commercial fishing activity is principally concentrated in the bays and inlets of Long Island which are the habitats of the shellfish

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[8]The extended 200 mile U.S. fisheries jurisdiction, enacted in 1976 under the Fishery Conservation and Management Act, no longer will allow extensive foreign operations and can aid in the long-term recovery of commercial finfishing in New York State (see Appendix B).

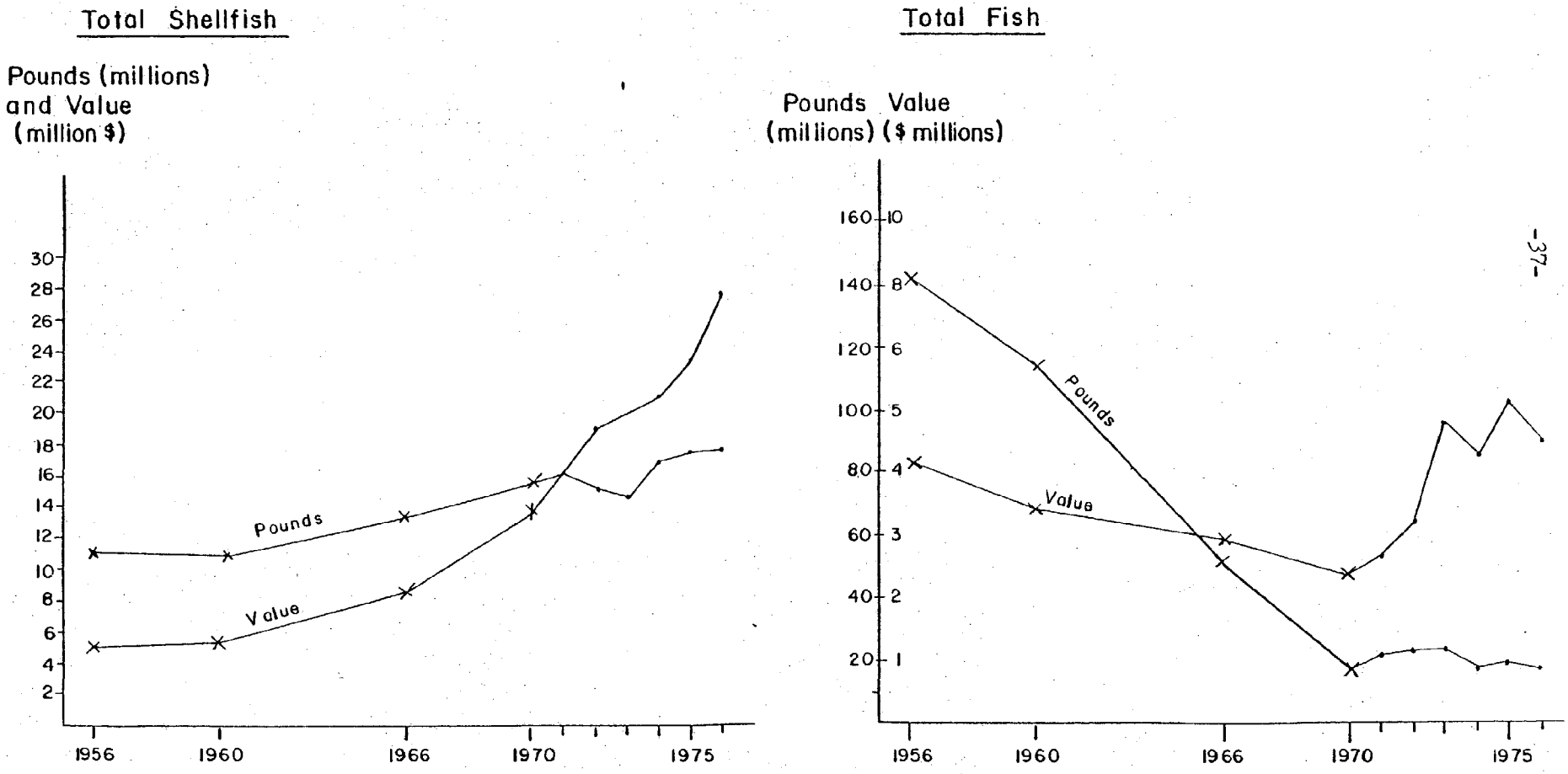
Table II-8: Major Marine Commercial Fisheries Species Landed in New York State
1966, 1971, 1976

Species	1966			1971			1976		
	Pounds (000)	Value ($000)	Value (% dist)	Pounds (000)	Value ($000)	Value (% dist)	Pounds (000)	Value ($000)	Value (% dist)
Fish:									
Butterfish	593	65	0.6	353	95	0.5	959	274	0.9
Flounders (Fluke)	2,466	586	5.2	1,090	360	1.9	3,203	1,500	4.7
Flounders (Yellow Tail)	3,486	305	2.7	7,242	449	2.4	595	168	0.5
Menhaden	4,870	82	0.7	999	36	0.2	1,014	43	0.1
Scup or Porgy	4,077	637	5.6	1,321	404	2.2	2,468	580	1.8
Seas Trout (Grey)	26	5	-	1,280	205	1.1	1,345	304	0.9
Stripped Bass	1,050	193	1.7	1,159	324	1.7	693	422	1.3
Whiting	2,008	89	0.8	1,058	95	0.5	2,546	290	0.9
Subtotal	18,576	1,962	17.3	14,855	1,968	10.6	12,823	3,581	11.1
Other Fish Species	32,102	950	8.4	5,212	585	3.2	3,728	809	2.6
Total Fish	50,678	2,912	25.7	20,067	2,553	13.8	16,551	4,390	13.7
Shellfish:									
Lobsters	730	613	5.4	1,791	2,054	11.1	593	1,338	4.2
Hard Clams	6,581	5,788	51.0	8,549	10,756	58.0	9,028	18,120	56.0
Surf Clams	1,840	148	1.3	3,688	438	2.4	3,455	1,1089	3.4
Oysters	177	335	3.0	788	1,682	9.0	1,901	4,764	14.8
Bay Scallops	317	323	2.8	144	234	1.3	438	816	2.5
Seas Scallops	2,128	1,009	8.8	402	609	3.2	758	1,236	3.8
Subtotal	11,773	8,216	72.4	15,352	15,773	85.1	16,173	27,363	85.1
Other Shellfish Species	1,662	221	1.9	824	219	1.1	1,438	387	1.2
Total Shellfish	13,435	8,437	74.3	16,176	15,992	86.2	17,611	27,750	86.3
Grand Total	64,113	11,349	100.0	36,243	18,544	100.0	34,163	32,139	100.0

Source: U.S. Department of Commerce, National Marine Fisheries Services

Chart II-2 Trends in Commercial Landings of Marine Fisheries

In New York State : 1956 – 1976



Source: National Marine Fisheries Service

species described previously. Even finfishing is primarily carried out within close proximity to the shore, generally within 12 miles of the shoreline (see table 9).

Seasonal variation in the levels of harvesting is characteristic of the industry with spring and summer being the peak harvest periods, although there are differences among individual species. Table 10 indicates this seasonal patterns, with data for 1976 and 1971. The seasonal nature of the industry results in the lack of full-time job opportunities and the National Marine Fisheries Service estimate that in 1975 two thirds of the 9,500 commercial fisherman were part-timers.

Landings are principally concentrated in Suffolk County with over 75% of the state's total. Nassau county accounts for about 15 percent of the landings, while Brooklyn, once harboring a major commercial fishing fleet, now has less than 10% of the landings. Manhattan's Fulton Fish Market, the major center of wholesale business, has not been a major landing port for commercial fleets for the past 20-30 years (see Appendix).

Economic Outlook for Industry

Commercial fishing in New York and indeed the entire Northeast is characterized by small, often family operated enterprises. Hard information about the income and profitability of the industry is lacking. However, those enterprises that have survived difficulties associated with depletion of commercial species and competition from more efficient domestic and foreign fleets are probably doing fairly well.

The growing demand for most fish and shellfish, which cannot be met from the relatively limited supply, has caused prices to increase dramatically over the past decade. Chart 3 indicates that the dockside prices for fish and shellfish landing in New York since 1967 have outpaced the overall consumer price index. While costs associated with harvesting have no doubt

Table II-9
Value of Principal Marine Commercial Species Landed in New York State
and National Data on Distance Caught from Shoreline

Fish:	Value[1] ($ millions)	Percentage Caught[2] 0-3 miles	3-12 miles	over 12 miles
Butterfish	0.3	48	13	39
Flounders	1.5	34	13	53
Scup or Porgy	0.6	38	8	54
Sea Trout	0.3	64	33	3
Stripped Bass	0.4	97	3	--
Whiting	.3	12	44	44
Shellfish:				
Lobsters	1.3	73	10	17
Hard Clams	18.1	100	--	--
Surf Clams	1.1	13	23	64
Oysters	4.8	100	--	--
Bay Scallops	0.8	100	--	--
Seas Scallops	1.2	4	6	90

Source: National Marine Fisheries Service:

[1]1976 Landings in New York State
[2]Fisheries of the United States, 1976; National Marine Fisheries Service

Table II-10
Seasonal Patterns of Commercial Fisheries Landings in New York State
Total Fish, Shellfish and Important Shellfish
Species: 1976 and 1971
(percent distribution based upon pounds landed annually)

	1976					
					Peak Month	
	1st Q	2nd Q	3rd Q	4th Q	Month	Percent
Total Fish	17	38	25	20	June	15
Total Shellfish	16	29	34	21	July	12
Hard Clams	15	29	37	19	July	14
Oysters	28	24	19	29	March	10
					Nov	10

	1971					
					Peak Month	
	1st Q	2nd Q	3rd Q	4th Q	Month	Percent
Total Fish	24	32	24	20	April	11
Total Shellfish	13	29	35	23	June	12
					July	12
					Aug	12

Source: National Marine Fisheries Service

increased significantly, it is likely that profit margins for commercial fishing enterprises (and for wholesalers as well) have been good.

The short-term outlook for commercial fishing in the state is however clouded by economic and environmental factors:

- Reduction in shellfish harvesting areas within the bays and nearby ocean waters because of water pollution problems.
- Over harvesting in many areas of shellfish and finfish species which is reducing the resource base.
- Requirements that the industry modernize in order to effectively compete and maintain its markets.

One positive factor that should prove to have long term benefits is the extension of the U.S. fisheries territorial jurisdiction to 200 miles under the 1976 Fisheries and Management Conservation Act. Since almost all of New York's current harvesting, as noted earlier, is within the 12 mile limit, the state's fishermen will not receive immediate benefits. The long-term expansion of the State's commercial fishing to deepwater species may however be possible as a result of this legislation (see Appendix B).

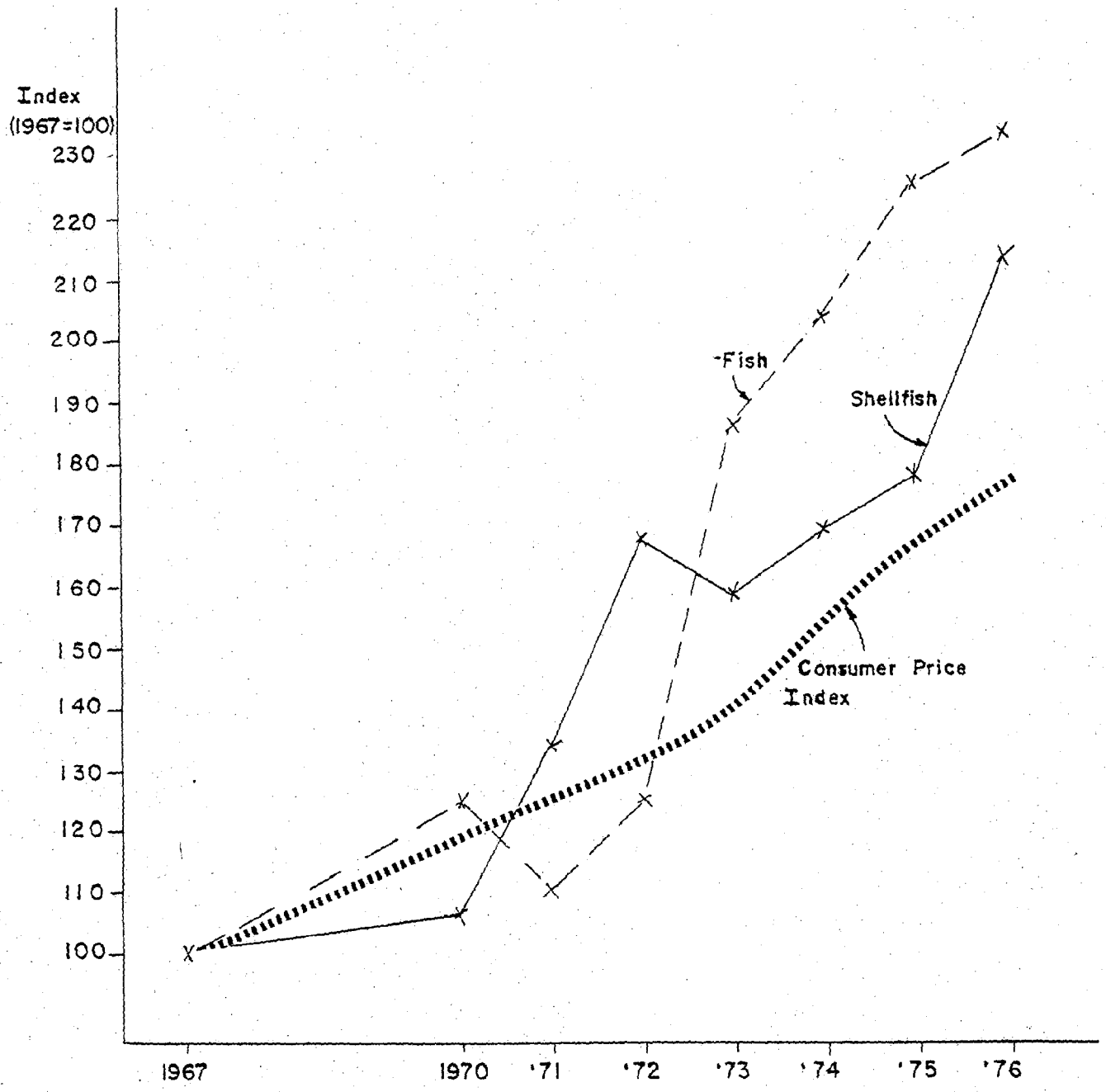
Potential Impact of OCS Activity

The potential implications of OCS exploration, development and recovery of oil and gas resources from the Baltimore Canyon and Georges Bank lease areas for the State's commercial fishing industry was evaluated with respect to the following considerations:

Impacts of Normal OCS Operations		Impacts of Spill and Discharges
At Sea	Onshore	
· Loss of fishing space	· Harbor and shore space	· Immediate physical reduction in harvesting areas
· Obstruction and debris	· Marine Services	· Long term implications on fish stocks
· Navigational hazards and benefits	· Labor Market and other business factors	

Chart II-3 Comparison of Price Changes: Average Dockside Prices of Fish & Shellfish Landings in New York & Overall Consumer Price Index for N.Y. Metro Area

(Index 1967 = 100)



Average Price Per Lb. Landed:

	1967	1970	'71	'72	'73	'74	'75	'76
Shellfish	.74	.86	.99	$1.24	$1.17	$1.25	$1.31	$1.58
Fish	.12	.15	.13	.15	.22	.24	.26	.27

Source: NMFS & US Bureau of Labor Statistics

These factors considered in the evaluation were from a study carried out by the Woods Hole Oceanographic Institute.[9] The specific implications for New York State's marine commercial fishing is based upon the general findings of this study and information concerning the overall characteristics of the state's commercial fisheries activity. These findings are however subject to further evaluation, especially with respect to micro impacts for particular segments of the industry. Only when the actual OCS energy recovery operations are initiated, will it be possible to identify the full range of prospective conflict situations.

Normal OCS Operations

With most of the State's fisheries harvesting occurring within 12 miles of the shore and the lease areas being over 75 miles from shore, there is not likely to be extensive at sea conflict situations. The situation for New York State fishermen in this respect is quite different from their New England counterparts. The Woods Hole study noted the fact that lease areas in the Georges Bank will be within one of the worlds richest fishing grounds. They however concluded that even on the Georges Bank, there shouldn't be significant overall adverse effect on commercial fishing. If New York State expands its deepsea finfish harvesting, then the question of at sea conflicts deserves greater attention.

Potential competition between commercial fishing and OCS activity with respect to onshore facilities and operations shouldn't be a problem for the state. Any prospective major OCS onshore support bases and other activities that the state may attract will very likely be located in the New York-New Jersey Port District, which doesn't have any sizable commercial fishing operations. If minor OCS onshore operations are located along the south shore of Long Island, they should be able to co-exist with commercial fishing

[9] Effects on Commercial Fishing of Petroleum Development off the Northeastern United States, (April, 1976).

activities. In fact, there could be positive contributions from OCS activities such as the upgrading of marine service facilities.

The indication is that the New York Area will attract only relatively moderate levels of OCS on-shore activities and facilities. Given the attributes and location of the commercial fishery industry and port bases, the probability of disruption from onshore OCS operations has to be considered highly improbable.

OCS Related Spills

Major oil spills, whether they occur well offshore in the leasing areas or nearshore should be of major concern. While the probability of the complete destruction of a major fisheries resource is very slight, spills may affect spawning areas and have unforeseen impacts on future fisheries. Given the precarious nature of commercial fishing, due to weather and other natural conditions, any factors that change even marginally harvesting conditions can cause economic dislocation. In an industry composed of relatively small enterprises, marginal impacts for the industry in general could significantly impact the viability of individual firms.

Major spills that occur in close-in waters, either through tanker accidents or a platform spill that reaches shoreline areas, could present critical problems. They may result in the immediate loss of harvesting opportunities because of bans on fishing to expedite cleanup operations. Additionally, if public health concerns develop, with respect to contamination of the fishery resources or their habitant, there could be prolonged economic misfortune for the commercial fishing industry.

Of principal concern to New York State, should be the prospect of a major spill that hits the extremely productive shellfish beds in Great South Bay and other similar grounds along Long Island's south shore. Spills in these locations could have substantial economic consequences even if they were relatively minor ones.

DEC did not develop the dollar losses or broader economic consequences from oil spills occurring at specific locations such as done for the shore-front recreational activity. A means of illustrating the overall potential direct effects of reductions in commercial harvesting activity from OCS spills is however possible.

Table 11 provides a basis for determining the dollar value of losses associated with spills reaching major fisheries that might reduce commercial harvesting levels. It illustrates the potential displaced or lost gross income to fisherman and losses valued at retail prices with July 1976 data. The month of July is generally the peak period for commercial landings.

At the maximum end of the scale, a 50% reduction in harvesting for the month of July 1976 would have resulted in a loss to commercial fisherman of $1.9 million ($5.2 million at the retail stage). A five percent reduction in harvesting for a week would result in a loss of $50,000 in gross income to the industry ($130,000 at the retail stage).[10]

While small overall reductions in harvesting would not wreck the industry as a whole, the complete loss of harvesting for a few individual fishermen or firms for a month or even a week can cause extreme financial hardships. Table 11, therefore cannot identify important micro implications, but can only illustrate the macro-effects. Since this is an industry dominated by micro enterprises, the socio-economic consequences of even small reductions in harvesting operations cannot be measuredusing this analysis.

The concern for the economic effects of oil spills and normal OCS operations should not be limited to only direct conflicts with New York

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[10] Given the upward pressures on the price of seafood products, in the future even without increase in the volume of harvesting, the state's commercial fisheries will become even more valuable. Therefore any reductions in harvesting occurring during the 1980's and 1990's as a result of OCS energy recovery conflicts will result in substantial higher economic losses.

State's commercial fisheries. The interdependence of the State's seafood industry with other domestic fishery resources was noted earlier in this section. Therefore, any potential major OCS related disruptions, along the Atlantic Coast might have substantial adverse economic ramifications for New York State.

Table II-11

ILLUSTRATION OF ECONOMIC IMPACTS OF
A REDUCTION IN COMMERCIAL HARVESTING
OFF N.Y. STATE MARINE WATERS*:
PEAK OF 1976 SEASON

	Month of July 1976 ($000)		Average Week in July ($000)	
	Gross Revenues of Commercial Fisherman	Retail Value of Seafood Products	Gross Revenues of Commercial Fisherman	Retail Value of Seafood Product
otal Value of Commercial Landing	$3,833[1]	$10,349[2]	$958[3]	$2,587[3]
Reduction in Commercial Harvesting (percentage)	Displaced or Lossed Values[5] ($000)[4]		Displaced or Lossed Values[5] ($000)[4]	
5%	-190	-520	-50	-130
10%	-380	-1,040	-100	-260
20%	-770	-2,070	-190	-520
50%	-1,920	-5,170	-480	-1,290

Addendum: total Harvest in July 1976 3,535,000 lbs of fish and shellfish[1]

*Principally reflects harvesting and landing within South Shore area of Long Island
[1]NY State Commercial landings in July 1976 as reported by National Marine Fisheries Service
[2]Based upon relative mark up indicated in Appendix table A-3
[3]Monthly values divided by 4 - reflects generalization rather than actual conditions
[4]Rounded to nearest $10,000
[5]Assume no price/supply interactions only that a reduction in harvesting leads to proportion change in revenues and income

PART III: APPENDIX MATERIAL

Table A-1: WORK SHEET TO DETERMINE 1976 EXPENDITURES FOR RECREATIONAL MARINE FISHING IN THE ATLANTIC OCEAN OFF N.Y. STATE

I. Estimating the number of primary anglers (major spending individuals)

A. 1970 Primary Anglers in New England and New York State = 1,666,000 (source: 1970 Salt-Water Angling Survey (National Marine Fisheries Service)

B. 1973-74 Survey of Participants in Marine Recreational Fishing*

New England and N.Y. State	5,013,000
N.Y. State	2,980,000
(Share)	59%

(*Source: NMFS NOTE: These figures are substantially larger than 1970 angler data because they include person under 12 years and "peripheral" participants.)

C. Estimates of 1976 Primary Anglers

New England & N.Y. State = 1,915,000

(Based upon assumption of 15% growth from 1970 figure of 1.7 million. Previous angler surveys showed following growth rates: 1960-65 = 32%
1965-70 = 9%

1. New York State Primary Anglers

1,915,000
X 59% see (B) above
1,130,000

2. Out of State Residents = 170,000 (Based upon proportion in 1973-74 survey who fished in N.Y. State but were out of State residents)

TOTAL 1,300,000

II. Estimating Expenditures

A. 1970 Average Expenditure Per Angler

Total=$127 (Source: 1970 Survey of Hunting & Fishing U.S. Dept. of Interior. Data is for entire Atlantic Coast Anglers.)

B. Estimated 1976 Average Expenditure per Angler

Total=$170 (see accompanying Table) for Atlantic Coast Anglers adjusted to $113 for Anglers off N.Y. State*

*reflects the assumption of an average of 8 recreational days per angler per year compared to 12 for all salt-water anglers in U.S. (from 1970 Survey)

C. 1,300,000 = 1976 Primary Anglers
(see I.C. 2)

X 65% (Percentage utilizing South Shore N.Y. City and Long Island locations and facilities and fishing in Atlantic rather than L.I. Sound.) DEC OCS Program assumption, likely to be conservative)

=845,000 - Primary Atlantic Ocean Anglers

X$113 - Average Annual Expenditure
(see B above)

= $ 95,800,000 TOTAL EXPENDITURES IN 1976

AVERAGE EXPENDITURES FOR RECREATIONAL SALT-WATER FISHING
ATLANTIC COAST: 1970 & ESTIMATES FOR 1976

	1970 Average Per Fisherman[1]	Update Indicies for 1976[2] Consumer Price Index Categories	1976 as % of 1970	1976 Estimated Average per Fisherman[3]
Total	$ 127.00	-	-	169.50[4]
Food & Lodging	18.50	Food	158%	29.00
Transportation	13.00	Private Transportation	148%	19.00
Fishing & Auxiliary Equipment	42.50	Recreational goods	122%	52.00
Bait, Public and Private fees and other trip expenses	53.00	Recreational services	131%	69.50

[1]From the 1970 National Survey of Hunting and Fishing (US Department of Interior Fish & Wildlife Service) Note: Categories are aggregates of detailed items rounded to nearest 50¢.

[2]U.S. Consumer Price Indicies published by the U.S. Bureau of Labor Statistics

[3]Column 1 X 2 rounded to 50¢

[4]Sum of components

TABLE A-2: Work Sheet for Calculating Value of Fish as Food Caught by Sportsfisherman Off South Shore

(1) Fish Caught per angler per year = 70
(From 1970 Salt Water Angling Survey Data for North Atlantic Region - N.E. plus NYS)

(2) Average Number of Angling Days Per Fisherman = 8
(All U.S. Salt Water Anglers = 12 Adjusted to New York State Conditions)

(3) Average Number of Fish Caught Per Angler Day = 8.8 (70÷8)

(4) Number of Catches Kept for Food = 5
(Assumption)

(5) Average Weight of Catches Kept = 2.5 lbs.
(Average weight of all fish caught in 1970 was 2.3 lbs for North Atlantic)

(6) Assumed Usuable Food Weight Per Catch = 1.0 lbs

(7) Number of lbs. of Usuable Food Per Angler Day = 5.0 lbs [(4) x (6)]

(8) Average Retail Price Per lbs. of Fish = $1.50
(Based Upon Retail Prices) low estimate

(9) Total Angler Day Value of Food = $7.50

(10) Total Annual Value = $50.7 million
($7.50 x 6,760,000 angling days)

Table A-3: VALUE OF MARINE COMMERCIAL FISH & SHELLFISH LANDED IN N.Y. STATE AT VARIOUS LEVELS:1976

	Value $(million)
(1) Commercial Landings	32.1
(2) Estimated Value at Wholesale Stage	67.4
(3) Estimated Value at Retail Stage	87.6

Sources: (1) National Marine Fisheries Service
NY State Landing Annual Summary 1976
(2) Commercial landings X 2.1, which is national mark up for fisheries products, includes mark ups in processing stages (National Marine Fisheries Service Fisheries of the U.S. 1976 p. 61
(3) Wholesale value X 1.3 which is retail mark up (same source)

Table A-4
Commercial Fisheries Landed in New York State by County - 1976, 1971, 1966

	1976			1971		
	Total	Fish	Shellfish	Total	Fish	Shellfish
New York State						
Lbs. (000's)	34,162	16,551	17,611	36,242	20,066	16,176
Percent	(100)	(100)	(100)	(100)	(100)	(100)
Suffolk County						
Lbs. (000's)	26,308	13,339	12,969	25,964	15,065	10,899
Percent	(77)	(81)	(74)	(72)	(75)	(67)
Nassau County						
Lbs. (000's)	4,871	994	3,877	6,037	1,526	4,511
Percent	(14)	(6)	(22)	(17)	(8)	(28)
Kings County						
Lbs. (000's)	2,449	2,194	255	3,593	3,301	292
Percent	(8)	(13)	(1)	(10)	(16)	(2)
New York County						
Lbs. (000's)	534	24	510	648	174	474
Percent	(2)	(*)	(3)	(2)	(1)	(3)

Note: *less than .055%
Source: National Marine Fisheries Service

Table A-5: Summary of Economic Activity and Values Associated with the Marine Commercial Seafood Industry in New York State

	Employment			Value			Data Sources
						($ millions)	
Atlantic Commercial Fisheries Harvesting in New York State	1975:	Full-time	3,200	Total Landings	1976:	32.1	National Marine Fisheries Service Statistics
		Part-time	6,300		1975:	28.1	
		Total	9,500		1971:	18.5	
					1966:	11.3	
Processing Activities (plants = 39)	1973:	1,150		Production 1973:		68.7	National Marine Fisheries Service Statistics
Wholesale Trade in Fish and Shellfish (NY Metro Area) (Establishments = 176)	1972:	1,420		Sales 1972:		257.2	U.S. Bureau of the Census, Wholesale Trade Census
Retail Trade Fish and Seafood Markets NY Metro Area (Establishments = 306)	1972:	970		Sales 1972:		59.8	U.S. Bureau of the Census Retail Trade Census

Table A-6: Update of Benchmark Sales and Value Data for New York State's Seafood Industry*

Benchmarks	1972 ($ millions)	Update Factors**	Percent	1976 Estimates ($ millions)
Retail Sales of Seafood establishments in New York Metro Area	59.8	Change in U.S. Consumer Price Index 1972-76 for Fish Products	+ 60%	95.7
Wholesale Sales of Fish and Seafood Establishments in New York Metro Area	257.2	Change in U.S. Wholesale Price Index 1972-1976 for Processed Fish and Shellfish	+ 42%	364.0
	1973 ($ million)			
Value of Processed Fish Products in New York State	68.7	Change in U.S. Price Index for the Output of Fresh or Frozen Package Processing Establishments	+ 36%	93.4

*Supporting Material for Chart in Section II-C. Assumes no change in volumes from benchmark year.
**U.S. Bureau of Labor Statistics

APPENDIX B

Implications of the Extended U.S. 200 Mile Jurisdiction for the Fisheries Resources & Fishing Activity of New York and the Northeast States

I. OVERVIEW OF FISHERIES RESOURCES

Major Fishing Grounds and Species

Most of the fisheries in the Northeast lie within the Continental Shelf. This shelf is relatively narrow from Virginia to Long Island and then broadens to encompass Georges Bank. The width of the shelf varies from a narrow thirty mile strip in the southern end to 150 miles in the north.

The production of various fisheries is roughly proportional to the amount of shoal water that they are based on. The wide coastal belt stretching from the Gulf of Maine out into Georges Bank and down to Long Island gives this area one of the worlds best fishing grounds. Most of the catch in this area is made up of cold water species of ground fish that are taken from the hard bottom shoals on banks. The various fishing banks range in size from a few square km. to larger plateau areas such as Georges Bank. Georges Bank which is located off the coast of Massachusettes is one of the most productive fishing grounds in the world.

The fisheries of the Northeast consist of seventy varieties of finfish and roughly twenty-five varieties of shellfish. This spectrum of species is dispersed through an equally diverse range of habitats. The mid-Atlantic is dominated by warm water species while the northern Atlantic is composed mostly of cold water fish. Species which dominate New England Fisheries are Flounder, Cod Whiting, Sea Scallops, Menhaden, Clam and Lobsters. The fisheries of the Middle Atlantic states (New York, New Jersey and Delaware) are composed mainly of Bluefish, Flounder, Clams, Lobster and Crabs. The Chesapeake regions fisheries are predominated by Alewives, Menhaden, Oysters, Clams, Crabs and Fluke.

Major Marine Economic and Recreational Activity

Recreational:

Until recently commercial fisheries took the greatest part of the total marine finfish catch in the United States. Recreational fishing though has now reached proportions which are significant with respect to the harvesting of the fisheries resources and the economy. Most species of fish today are now harvested by both commercial and sport fishermen. Contrary to some years ago, the catch of marine sport fishing is needed to provide a complete picture regarding the "consumption" of marine finfish resources (the majority of shellfish harvested is done by the commercial fishing industry).

Recreational salt water anglers fish in one of two principal areas; offshore in the ocean or in the various sounds, rivers and bays. They fish from one of four places; a private or rented boat, a party or charter boat, a bridge or pier, or a beach or bank.

The species most frequently caught by anglers in the Northeast region of the Atlantic includes Flounder, Atlantic Mackerel, Puffers, Bluefish and Striped Bass.

Nationwide in 1955 there were a total of 4,557,000 salt water anglers. The number more than doubled by 1970 to 9,392,000 which indicates how popular sport fishing has become over the years. In the Northeast Atlantic region the number of anglers or sport fishermen increased by almost 1 million from 1960 to 1970 (see table #1), a 37 percent increase. In the same ten year period the number of fish caught also increased 35 percent, and the weight of fish caught increased

42 percent. The amount of money spent on recreational fishing (on the Atlantic coast) totaled $636 million dollars in 1970. Boats and bait were the two largest expenditures.

As for some of the characteristics of salt water anglers; 40 percent of the fishermen live in the suburbs and small cities while 31 percent live in the big cities and 29 percent live in the rural areas. The age group for males which contained the most fishermen was the 25-34 age bracket. As for females the 18-24 age bracket held the most. As a rule the higher the income level the more fishing activity which takes place. For example in the income bracket of 3000-4000 dollars a year, only 3.9 percent of the total population participated in salt water angling. On the other hand 7.9 percent angled in the 15000-24000 income level.

U.S. Commercial Industry:

The U.S. Commercial fishing industry in the North Atlantic is a very important industry to the regions' economy. Many fishermen find it necessary to engage in several types of fishing because the availability of fish and shellfish change with the seasons. Fishermen tend to operate from a single port year round, but there is some local interchange between ports. A few of the larger vessels change ports and make the rounds to maximize their income. Most fish is sold by individual bargaining between the fishermen and a dealer.

In the mid-Atlantic Bight Area (New York, New Jersey and Delaware) many of the fisheries consist of inshore activities like clamming and oystering. These fisheries however provide considerable shoreside employment which boosters the economy of many small communities.

In the North Atlantic region about 60 to 65 percent of the fish caught is used for direct human consumption. The rest is manufactured into industrial products such as meal and oil.

The products of the Atlantic fisheries are marketed nationwide. Lobsters are shipped by air to retail outlets and restaurants and other fish are distributed widely. Markets for a few species have developed in areas remote from the Atlantic region by filling a need or short supply which existed at the time.

Over the years, since 1956, the amount of finfish caught by the Northeast fishermen has decreased (see table #2). The large decline in poundage harvested was due to the reduced catches of a single species, the menhaden. This fish, which constituted fifty percent of the landings in the North Atlantic region is used for industrial purposes and has a low per unit value.

The steady increase in the value of commercial landings over the years, while poundage has declined substantially (see table #2), reflects increasing demand for fish and rapidly increasing unit prices. Shellfish landings have both increased in poundage and value, with the values increasing at a greater rate. This also reflects the high consumer demand which cannot be satisfied by the moderate increase in supply. New York State has basically followed the trend of the rest of the Northeast (see table #2), with however even greater emphasis on shellfishing.

A good indication that the commercial fishing industry in the Northeast is a growing industry is the value of processed products of fish. In 1956 total processed fish products for the Northeast were valued at $239 million. This figure tripled to $742 million in 1973.

In New York State the 1956 value increased 2.5 times in the 18 year period.

Some of the important commercial species to the Northeast in regard to total value are Cod, Flounder, Perch, Lobster, Shrimp, Clams, Scallops, Menhaclen, Oysters, Fluke, Striped Bass and Crabs.

The Importance of Foreign Catches:

The fishing of Foreign Fleets off U.S. Coasts is the result of an international agreement set up by the International Commission for the Northwest Atlantic Fisheries, (ICNAF) which was established in 1949. Foreign fleets first began fishing in the coastal waters from Block Island to Cape Hatteras in the early 1960's.

International competition has intensified for the same fish and shellfish that were once considered resources belonging solely to the U.S. During the past decade foreign fishing off U.S. Coastal waters has expanded rapidly. Large foreign fishing fleets which consist of fishing craft, factory ships and support vessels operated on U.S. fishing grounds such as Georges Bank.

Construction of large trawlers and factory ships by foreign fleets greatly increased their harvests, while the U.S. has not kept pace. These large trawlers have contributed to serious overfishing of the fisheries, created conservation problems and harmed the domestic industry.

The principal industrial fish in New England, the red hake was heavily harvested by the U.S.S.R. This has hurt New England's economy to a certain extent. Other species of economic importance which are

likely to be overfished are silver hake, bluefish, black sea bass and scup.

It is probable that the catch by foreign nations has affected the abundance of many of the migratory species in the New York fishing areas. However, shellfish such as oysters and clams which are very important to New York's economy were protected by the previous 12 mile fishing limit.

II. COMPARING THE HARVESTING OF FISHERY RESOURCES:

Fishery resources off the Atlantic coast are harvested by three sources; U.S. recreational fishermen, U.S. commercial fishermen and foreign fishermen. Table #3 compares the catch of these three sources by major species.

Certain species are mainly of recreational importance (this can be seen from 'the percent of total species' columb of table 3). These species include bluefish, striped bass, tautog, weakfish, spot and puffers. They have little commercial value to the U.S. but are important recreational species.

Six of these species listed (table 3) are dominated by the U.S. commercial fishing industry. Generally, these species are located relatively near the coast. This means that they are probably located near or within the previous 12 mile fishing limit. This 12 mile limit was off limits to foreign fishermen and explains why the U.S. dominates the six species. Four of these six species are shellfish which are high value resources.

The largest amount of any fish caught is menhaden, with thirty-eight percent of all commercial catches being menhaden. However, menaden is a low value fishery.

The important fact that table 3 reveals is the species in which U.S. and foreign commercial are in competition for. Only three species are in direct competition; Cod, Alewive, and Herring. The 200 mile jurisdiction will make these three species more available for U.S. fishermen and reduce their availability to foreign fleets (see next section). Since forty-two percent of all foreign catches depends on herring, this could have an important impact on the overall fish supplies in certain foreign counties.

Analysis of Harvesting Data Sources:

The original data which table 3 is based upon was derived from three different sources. Data for U.S. recreational fishing was obtained from the "1970 Salt Water Angling Survey," U.S. Marine Fisheries Services. U.S. Commercial data comes from "Fishing Statistics of the United States, 1970" also published by the National Marine Fisheries Services, and the Foreign data was from Historical Statistics of the Fisheries of the New York Bight Area," New York Sea Grant Institute.

In the "1970 Salt Water Angling Survey," the data was based on a sample which was selected from the Current Population Survey (CPS). The selected sample of fishermen were interviewed as to the type and number of fish they caught. There exists two types of errors in this survey. The first type is a standard error which reflects the relationship of a selected sample to the total population. The other error is a bias of response. In this case the bias tended to be on the positive

side since recreational fishermen will sometimes exaggerate.

Data for the U.S. commercial fishing was collected by the National Marine Fishery Service in Cooperation with various state agencies (the states included in Table 3 are east coast states from Maine thru Virginia). In many cases only partial surveys were taken and as in all sample surveys some error does exist.

In "Historical Statistics of the Fisheries of the New York Bight Area," data for foreign catches covers the Georges Bank to Cape Hatteras, North Carolina. U.S. receational and commercial data includes roughly Maine to North Carolina while foreign data excludes Maine. Foreign catches of several species lack sufficient data as a result of landings over the previous U.S. quota but only reporting the quota or less.

III. THE EXTENDED 200 MILE U.S. JURISDICTION:

Background:

On April 13, 1976, President Ford signed into law H.R. 200, the Fishery Conservaton and Management Act. This act is a national program for the conservation and management of all living resources out to 200 miles from the coast. This area has been named the Fishery Conservation Zone.

The act stimpulates agreements between the U.S. and foreign nations on allotments of fish that the nations are able to catch within the zone. So far 18 counties have entered into this agreement which was officially named, "The Governing International Fishing Agreement."

Each foreign fishing vessel must obtain a permit from the U.S. Department of State before they are able to enter the zone. The

permit is obtained by submitting an application to the Department of State which describes the physical features of the vessel, anticipated catch and the area it will be fishing in. The director of National Marine Fisheries Service reviews all applications. After consultation with the Department of State and the Coast Guard he may approve the application. The conditions and restrictions on the approval of the application, and request for fees, are sent to the foreign nation through the Department of State.

There are two types of fees that a foreign vessel must pay; a fixed annual fee and a poundage fee. There is also an observer fee which requires the foreign nation to pay the U.S. all costs of placing observers on board a foreign vessel.

The Fishery Conservation and Management Act establishes seven standards or rules for the zone. These rules basically deal with fishery management and conservation measures. For example, one of the seven standards is, "Conservation and management measures shall be based on the best scientific information available." Another standard says, "Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication."

Eight Regional Fishery management Councils were set up under the Act. Each one is responsible for preparing a management plan for its designated geographical area. The Secretary of Commerce has the responsibility to implement or amend any management plans. The Secretary may promulgate such regulations as may be necessary to implement any approved Fishery Management Plan.

Enforcement of the Act is a joint responsibility of the Secretary of Commerce and the Coast Guard.

Implications of the 200 mile Jurisdiction:

Table 4 shows the implications of the 200 mile jurisdiction on the foreign fishing industry. The table presents the major species harvested by foreign nations in 1975 and the allocations under the Fishery Conservation and Management Act (200 mile limit) for 1977.

The greatest impact of the act with respect to restricting will be on Atlantic Herring and Mackerel. Foreign fleets caught seven times as much Atlantic Herring before the act as they will be able to in 1977. Since table 3 showed that 42 percent of all foreign catches are Herring, there could be significant economic implications for certain foreign counties.

Before it can be determined what the long term economic impact of the 200 mile jurisdiction will result in for the U.S. and specific states, an understanding of the biological implications on the fisheries themselves must be developed. Currently we can assume with reasonable certainty that the fisheries that were being over-fished will replenish themselves since less pressure on foreign fishermen is being put on them. This will eventually mean a greater supply of certain species for domestic fishermen.

Three major species exist on the east coast in which U.S. commercial and foreign commercial were in competition for, before the jurisdiction; Cod, Alewives and Herring (see table 3). The Herring is quite important to foreign fishing but is fairly insignificant to the Northeast fishing industry. Herring makes up only 5 percent of the

commercial catches (see table 3). The 200 mile jurisdiction therefore should not greatly affect the Northeast fishing industry in regard to Herring. Cod made up 4 percent of commercial catches while Alwives was only 2 percent. Even though the foreign nations are not able to catch either Cod or Alewives off the eastern coast, leaving greater supplies for domestic fishermen, the jurisdiction should not affect the fishing industry greatly.

The long term implications of the 200 mile jurisdiction for New York are not clear. There are not likely to be immediate significant benefits to the state's commercial fishing industry which is principally based on shellfish catches within the 12 mile limit, and therefore not having been accessible to foreign fleets.

The longer range benefits to the State of the 200 mile jurisdiction will at least mean a potential supply of fisheries for fishermen to harvest. One result of the greater supply could be the expansion of the State's finfishing industry. However, this is dependent upon complex factors including the economics of finfishing, processing and distribution in New York versus other Northeast states such as Massachusettes which may more significantly benefit from restrictions on foreign catches.

IV. FURTHER ANALYSIS AND RESEARCH PRIORITIES FOR NEW YORK STATE:

Even though the New York State fishing industry may not benefit greatly from the 200 mile jurisdiction we should nonetheless intensify research on the potential implications. Policy options should be explored regarding the prospect to expand marine recreational and

commercial fishing. Monitoring should be done on the fisheries to see what the accomplishments of the act were.

A major role for the future of New York fisheries lies with the Mid-Atlantic Council, which is one of the eight Regional Fishery Management Councils. It is their mission to develop management plans for New York's fisheries. The management plans will have to consider numerous factors and diverse interests if it is to be successful. The Council must develop measures that will maintain the resources at an optimal level of abundance. Information on the resources must be provided to fishermen which will aid them in more efficient operations and to ultimately aid the public by providing more abundant and reasonable fish products.

The plans which the Council must consider contain some highly charged issues such as should the resources be developed for the benefit of recreational or commercial fishermen. Questions like these must be addressed.

Potential opportunities exist to aid the economy of the state while carrying out desirable resource management strategies for preserving important fishery resources.

Table B-1: Estimated number of salt water anglers and catches on the Atlantic Coast: Maine through Virginia

	1960	1965	1970
		(Thousands)	
Number of Anglers	2,504	2,905	3,433
Number of fish caught	211,885	264,786	285,223
		(thousands of lbs.)	
Weight of fish caught	361,740	444,648	513,718

Source: "1970 Salt Water Angling Survey"
U.S. Department of the Interior

Table B-2: U.S. Commercial Landings off the North East Coast[1/]
1956, 1966, 1973 and 1976

	Thousand Pounds				Thousand Dollars			
	1956	1966	1973	1976	1956	1966	1973	1976
Northeast								
Finfish	2,252,703	1,098,000	1,209,000	-	59,920	59,000	94,000	-
Shellfish	193,339	256,000	266,000	-	62,948	76,000	129,000	-
Total	2,446,042	1,354,000	1,475,000	1,398,063	122,868	135,000	223,000	318,307
New York								
Finfish	142,358	51,000	22,000	-	4,210	3,000	5,000	-
Shellfish	11,206	13,000	15,000	-	5,154	9,000	17,000	-
Total	153,564	64,000	37,000	34,000	9,364	12,000	22,000	32,403
N.Y. as Percent of N.E.								
Finfish	6.3%	4.6%	1.8%	-	7.0%	5.1%	5.3%	-
Shellfish	5.8%	5.1%	5.6%	-	8.2%	11.8%	13.2%	-
Total	6.3%	4.7%	2.5%	2.4%	7.6%	8.9%	9.9%	10.2%

Footnote: Includes the Atlantic Coast from Maine through Virginia

Sources: Fishery Statistics of the U.S. 1956, 1966, 1973 and Historical Statistics of the Fisheries of the New York Bight Area, 1976

Table B-3: Recreational, U.S. Commercial and Foreign Catches of Major Species off the Northeast Coast: 1970

	U.S. Recreational[1] (000 of lbs)		U.S. Commercial[1] (000 of lbs.)		Foreign[1] (000 of lbs.)	
Total Catches (all species)	513,718		1,301,713		1,300,736	
Major Species[2]	% of Recreational Catches	% of Total Species[3]	% of Commercial Catches	% of Total Species[3]	% of Foreign Catches	% of Total Species[3]
Bluefish	.19	(.96)	-		-	
Cods	.07	(.32)	.04	(.47)	.018	(.21)
Flounder	.11	(.32)	.09	(.67)	-	
Red Hake						
Silver Hake	-		-		.012	(.84)
Mackerel	.14	(.13)	-		.055	(.97)
Perch	.02	(.19)	.04	(.81)	-	
Puffers	.05	(1.0)	-		.35	(.85)
Sharks	-		-		.009	(.64)
Spot	.04	(.77)	-		-	
Stripped Bass	.14	(.89)	-		-	
Tautog	.03	(.99)	-		-	
Weakfish	.03	(.86)	-		-	
Alewives	-		.02	(.36)	.03	(.64)
Butterfish	-		-		.015	(.84)
Herring	-		.05	(.12)	.42	(.89)
Menhaden	-		.38	(1.0)	-	
Whiting	-		.03	(1.0)	-	
Sea Scallop	-		-		.06	(.93)
Crabs	-		.06	(1.0)	-	
Lobsters	-		.03	(1.0)	-	
Shrimp	-		.02	(1.0)	-	
Clams	-		.07	(1.0)	-	
Squid	-		-		.02	(.90)

1/ Source: U.S. Recreational - 1970 Salt Water Angling Survey; U.S. Commercial - 1970 Fishery Statistics of the U.S.; Foreign - Historical Statistics of the Fisheries of the N.Y. Bight Area:
The Geographical Coverage includes the east coast roughly from Georges Bank to Cape Hatteras N.C. The three categories though may not cover exactly the same geographic areas.

2/ Species in which 10,000,000 lbs. or more were caught in any one of the three categories

3/ Percentage of total recreation, commercial and foreign catches in the species.

Table B-4: Comparison of Foreign Harvest off the Northeast Coast in 1975 and East Coast 1977 Allocations under U.S. Extended 200 Mile Jurisdiction

Allocated Species	1975 Harvest (million lbs.)	1977 Allocation (million lbs.)	Ratio 75 Harvest/77 Allocatio (million lbs.)
Silver Hake	202.5	162.5	1.2:1
Atlantic Mackerel	548.4	136.4	4:1
Atlantic Herring	312.0	44.5	7:1
Squid	1300.0	86.2	1.5:1
Butterfish	16.3	11.4	1.4:1
Red Hake	57.5	66.4	0.9:1

Source: Fisheries of the United States, 1976 and Historical Statistics of the Fisheries of the N.Y. Bight Area (July 1976)

Footnotes: 1/ Species and allocations were listed by Country; total allocations per country were as follows: Bulgaria - 17.8 million lbs.; Romania - 3.1; Poland - 82.0; Japan - 47.4; Spain - 31.7; USSR - 370.2; German Democratic Republic - 44.5; Federal Republic of German - 14.3; France - 2.6; Italy - 9.3. These allocations are for the entire East Coast while 1975 Harvest covers area from Massachusetts to North Carolina

These are from only ten of the eighteen countries that have signed fishing agreements. The other countries include: Belgium, Denmark, Ireland, Luxembourg, Netherlands, Republic of Korea, Replublic of China, and the United Kingdom.